This key should allow you to understand why you choose the option you did (beyond just getting a question right or wrong). More instructions on how to use this key can be found here.

If you have a suggestion to make the keys better, please fill out the short survey here.

Note: This key is auto-generated and may contain issues and/or errors. The keys are reviewed after each exam to ensure grading is done accurately. If there are issues (like duplicate options), they are noted in the offline gradebook. The keys are a work-in-progress to give students as many resources to improve as possible.

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1. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-7 + 6x > 7x \text{ or } -7 + 8x < 10x$$

The solution is $(-\infty, -7.0)$ or $(-3.5, \infty)$, which is option A.

A. $(-\infty, a) \cup (b, \infty)$, where $a \in [-9.75, -3.75]$ and $b \in [-4.5, -2.25]$

* Correct option.

B. $(-\infty, a] \cup [b, \infty)$, where $a \in [-8.25, -5.25]$ and $b \in [-6, 1.5]$

Corresponds to including the endpoints (when they should be excluded).

C. $(-\infty, a] \cup [b, \infty)$, where $a \in [-0.75, 5.25]$ and $b \in [4.5, 7.5]$

Corresponds to including the endpoints AND negating.

D. $(-\infty, a) \cup (b, \infty)$, where $a \in [0.75, 6.75]$ and $b \in [3.75, 8.25]$

Corresponds to inverting the inequality and negating the solution.

E. $(-\infty, \infty)$

Corresponds to the variable canceling, which does not happen in this instance.

General Comment: When multiplying or dividing by a negative, flip the sign.

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2. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$\frac{3}{9} + \frac{3}{5}x \geq \frac{6}{6}x - \frac{8}{4}$$

The solution is $(-\infty, 5.833]$, which is option B.

A. $(-\infty, a]$, where $a \in [-9.75, -3.75]$

$(-\infty, -5.833]$, which corresponds to negating the endpoint of the solution.

B. $(-\infty, a]$, where $a \in [5.25, 8.25]$

* $(-\infty, 5.833]$, which is the correct option.

C. $[a, \infty)$, where $a \in [4.5, 6.75]$

$[5.833, \infty)$, which corresponds to switching the direction of the interval. You likely did this if you did not flip the inequality when dividing by a negative!

D. $[a, \infty)$, where $a \in [-7.5, -4.5]$

$[-5.833, \infty)$, which corresponds to switching the direction of the interval AND negating the endpoint. You likely did this if you did not flip the inequality when dividing by a negative as well as not moving values over to a side properly.

E. None of the above.

You may have chosen this if you thought the inequality did not match the ends of the intervals.

General Comment: Remember that less/greater than or equal to includes the endpoint, while less/greater do not. Also, remember that you need to flip the inequality when you multiply or divide by a negative.

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3. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$\frac{3}{7} - \frac{5}{4}x < \frac{9}{8}x - \frac{10}{2}$$

The solution is $(2.286, \infty)$, which is option B.

A. (a, ∞), where $a \in [-5.25, -1.5]$

$(-2.286, \infty)$, which corresponds to negating the endpoint of the solution.

B. (a, ∞), where $a \in [0, 5.25]$

* $(2.286, \infty)$, which is the correct option.

C. $(-\infty, a)$, where $a \in [-2.25, 5.25]$

$(-\infty, 2.286)$, which corresponds to switching the direction of the interval. You likely did this if you did not flip the inequality when dividing by a negative!

D. $(-\infty, a)$, where $a \in [-3.75, 0.75]$

$(-\infty, -2.286)$, which corresponds to switching the direction of the interval AND negating the endpoint. You likely did this if you did not flip the inequality when dividing by a negative as well as not moving values over to a side properly.

E. None of the above.

You may have chosen this if you thought the inequality did not match the ends of the intervals.

General Comment: Remember that less/greater than or equal to includes the endpoint, while less/greater do not. Also, remember that you need to flip the inequality when you multiply or divide by a negative.

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4. Using an interval or intervals, describe all the x-values within or including a distance of the given values.

More than 7 units from the number 9.

The solution is $(-\infty, 2) \cup (16, \infty)$, which is option B.

A. $(2, 16)$

This describes the values less than 7 from 9

B. $(-\infty, 2) \cup (16, \infty)$

This describes the values more than 7 from 9

C. $[2, 16]$

This describes the values no more than 7 from 9

D. $(-\infty, 2] \cup [16, \infty)$

This describes the values no less than 7 from 9

E. None of the above

You likely thought the values in the interval were not correct.

General Comment: When thinking about this language, it helps to draw a number line and try points.

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5. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-6 - 9x \leq \frac{-36x - 7}{8} < 7 - 5x$$

The solution is $[-1.14, 15.75)$, which is option B.

A. $(a, b]$, where $a \in [-1.72, -0.9]$ and $b \in [13.5, 18]$

$(-1.14, 15.75]$, which corresponds to flipping the inequality.

B. $[a, b)$, where $a \in [-4.12, 0.53]$ and $b \in [13.5, 20.25]$

$[-1.14, 15.75)$, which is the correct option.

C. $(-\infty, a) \cup [b, \infty)$, where $a \in [-2.62, -0.22]$ and $b \in [14.25, 21]$

$(-\infty, -1.14) \cup [15.75, \infty)$, which corresponds to displaying the and-inequality as an or-inequality AND flipping the inequality.

D. $(-\infty, a] \cup (b, \infty)$, where $a \in [-3.38, 0]$ and $b \in [13.5, 19.5]$

$(-\infty, -1.14] \cup (15.75, \infty)$, which corresponds to displaying the and-inequality as an or-inequality.

E. None of the above.

General Comment: To solve, you will need to break up the compound inequality into two inequalities. Be sure to keep track of the inequality! It may be best to draw a number line and graph your solution.

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6. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-6x + 7 > -4x - 3$$

The solution is $(-\infty, 5.0)$, which is option D.

A. $(-\infty, a)$, where $a \in [-7, 1]$

$(-\infty, -5.0)$, which corresponds to negating the endpoint of the solution.

B. (a, ∞), where $a \in [-6, -1]$

$(-5.0, \infty)$, which corresponds to switching the direction of the interval AND negating the endpoint. You likely did this if you did not flip the inequality when dividing by a negative as well as not moving values over to a side properly.

C. (a, ∞), where $a \in [4, 8]$

$(5.0, \infty)$, which corresponds to switching the direction of the interval. You likely did this if you did not flip the inequality when dividing by a negative!

D. $(-\infty, a)$, where $a \in [1, 10]$

* $(-\infty, 5.0)$, which is the correct option.

E. None of the above.

You may have chosen this if you thought the inequality did not match the ends of the intervals.

General Comment: Remember that less/greater than or equal to includes the endpoint, while less/greater do not. Also, remember that you need to flip the inequality when you multiply or divide by a negative.

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7. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-5 + 5x > 7x \text{ or } -4 + 7x < 10x$$

The solution is $(-\infty, -2.5)$ or $(-1.333, \infty)$, which is option B.

A. $(-\infty, a] \cup [b, \infty)$, where $a \in [-5.25, -1.5]$ and $b \in [-6.75, 0.75]$

Corresponds to including the endpoints (when they should be excluded).

B. $(-\infty, a) \cup (b, \infty)$, where $a \in [-3.97, -0.67]$ and $b \in [-3.75, -0.75]$

* Correct option.

C. $(-\infty, a) \cup (b, \infty)$, where $a \in [1.05, 3]$ and $b \in [1.5, 3]$

Corresponds to inverting the inequality and negating the solution.

D. $(-\infty, a] \cup [b, \infty)$, where $a \in [-0.75, 9]$ and $b \in [0.75, 3.75]$

Corresponds to including the endpoints AND negating.

E. $(-\infty, \infty)$

Corresponds to the variable canceling, which does not happen in this instance.

General Comment: When multiplying or dividing by a negative, flip the sign.

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8. Using an interval or intervals, describe all the x-values within or including a distance of the given values.

No less than 8 units from the number 4.

The solution is $(-\infty, -4] \cup [12, \infty)$, which is option A.

A. $(-\infty, -4] \cup [12, \infty)$

This describes the values no less than 8 from 4

B. $(-\infty, -4) \cup (12, \infty)$

This describes the values more than 8 from 4

C. $[-4, 12]$

This describes the values no more than 8 from 4

D. $(-4, 12)$

This describes the values less than 8 from 4

E. None of the above

You likely thought the values in the interval were not correct.

General Comment: When thinking about this language, it helps to draw a number line and try points.

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9. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$-8 - 7x < \frac{-42x + 8}{9} \leq 5 - 5x$$

The solution is $(-3.81, 12.33]$, which is option C.

A. $[a, b)$, where $a \in [-6.75, 2.25]$ and $b \in [9, 13.5]$

$[-3.81, 12.33)$, which corresponds to flipping the inequality.

B. $(-\infty, a] \cup (b, \infty)$, where $a \in [-9.75, 0]$ and $b \in [12, 17.25]$

$(-\infty, -3.81] \cup (12.33, \infty)$, which corresponds to displaying the and-inequality as an or-inequality AND flipping the inequality.

C. $(a, b]$, where $a \in [-6, 0]$ and $b \in [10.5, 14.25]$

* $(-3.81, 12.33]$, which is the correct option.

D. $(-\infty, a) \cup [b, \infty)$, where $a \in [-5.25, -3]$ and $b \in [10.5, 15]$

$(-\infty, -3.81) \cup [12.33, \infty)$, which corresponds to displaying the and-inequality as an or-inequality.

E. None of the above.

General Comment: To solve, you will need to break up the compound inequality into two inequalities. Be sure to keep track of the inequality! It may be best to draw a number line and graph your solution.

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10. Solve the linear inequality below. Then, choose the constant and interval combination that describes the solution set.

$$5x + 10 < 10x + 7$$

The solution is $(0.6, \infty)$, which is option D.

A. $(-\infty, a)$, where $a \in [-0.83, -0.34]$

$(-\infty, -0.6)$, which corresponds to switching the direction of the interval AND negating the endpoint. You likely did this if you did not flip the inequality when dividing by a negative as well as not moving values over to a side properly.

B. (a, ∞), where $a \in [-2.1, -0.1]$

$(-0.6, \infty)$, which corresponds to negating the endpoint of the solution.

C. $(-\infty, a)$, where $a \in [-0.35, 2.13]$

$(-\infty, 0.6)$, which corresponds to switching the direction of the interval. You likely did this if you did not flip the inequality when dividing by a negative!

D. (a, ∞), where $a \in [-0.4, 4.9]$

* $(0.6, \infty)$, which is the correct option.

E. None of the above.

You may have chosen this if you thought the inequality did not match the ends of the intervals.

General Comment: Remember that less/greater than or equal to includes the endpoint, while less/greater do not. Also, remember that you need to flip the inequality when you multiply or divide by a negative.
